

CLAIMS

1. An aqueous pharmaceutical formulation comprising:
 - (a) an isolated anti-A β protofibril antibody or fragment thereof that binds to human A β protofibrils, at a concentration of 80 mg/mL to 300 mg/mL,
 - (b) 100 mM to 400 mM arginine,
 - (c) 0.01% w/v to 0.1% w/v polysorbate 80, and
 - (d) a pharmaceutically acceptable buffer,wherein the pharmaceutical formulation has a pH ranging from 4.5 to 5.5,
wherein the isolated anti-A β protofibril antibody or fragment thereof comprises: (i) a heavy chain variable domain comprising the amino acid sequence of SEQ ID NO:1, and (ii) a light chain variable domain comprising the amino acid sequence of SEQ ID NO:2, and
wherein the arginine is arginine, arginine hydrochloride, or a combination thereof.
2. The pharmaceutical formulation according to claim 1, wherein the isolated anti-A β protofibril antibody or fragment thereof is present in a concentration of 100 mg/mL to 200 mg/mL.
3. The pharmaceutical formulation according to claim 1, wherein the isolated anti-A β protofibril antibody or fragment thereof is present in a concentration of 100 mg/mL.
4. The pharmaceutical formulation according to claim 1, wherein the isolated anti-A β protofibril antibody or fragment thereof is present in a concentration of 200 mg/mL.
5. The pharmaceutical formulation according to any one of claims 1-4, further comprising methionine.
6. The pharmaceutical formulation according to any one of claims 1-5, wherein the pharmaceutically acceptable buffer is citrate buffer or histidine buffer.

7. The pharmaceutical formulation according to any one of claims 1-6, comprising 10 to 100 mM citrate buffer or 10 to 100 mM histidine buffer.
8. The pharmaceutical formulation according to any one of claims 1-7, comprising 125 to 350 mM arginine.
9. The pharmaceutical formulation according to any one of claims 1-8, comprising 200 mM arginine, wherein the arginine is arginine hydrochloride.
10. The pharmaceutical formulation according to any one of claims 1-9, comprising 200 mM arginine, wherein the arginine is arginine hydrochloride, and 25 mM histidine buffer.
11. An aqueous pharmaceutical formulation comprising:
 - (a) 80 mg/mL to 240 mg/mL of an isolated anti-A β protofibril antibody or fragment thereof comprising: (i) a heavy chain variable domain comprising the amino acid sequence of SEQ ID NO:1, and (ii) a light chain variable domain comprising the amino acid sequence of SEQ ID NO:2,
 - (b) 140 mM to 260 mM arginine hydrochloride,
 - (c) 0.02% w/v to 0.08% w/v polysorbate 80, and
 - (d) 15 mM to 35 mM histidine buffer,wherein the pharmaceutical formulation has a pH ranging from 4.5 to 5.5.
12. An aqueous pharmaceutical formulation comprising:
 - (a) 80 mg/mL to 120 mg/mL of an isolated anti-A β protofibril antibody or fragment thereof comprising: (i) a heavy chain variable domain comprising the amino acid sequence of SEQ ID NO:1, and (ii) a light chain variable domain comprising the amino acid sequence of SEQ ID NO:2,
 - (b) 240 mM to 360 mM arginine,
 - (c) 0.02% w/v to 0.08% w/v polysorbate 80, and

(d) 30 mM to 50 mM citrate buffer,

wherein the pharmaceutical formulation has a pH ranging from 4.5 to 5.5,

and wherein the arginine is arginine, arginine hydrochloride, or a combination thereof.

13. A method of reducing aggregate formation of an isolated anti-A β protofibril antibody or fragment thereof, comprising:

providing an aqueous pharmaceutical formulation comprising an isolated anti-A β protofibril antibody or fragment thereof comprising: (i) a heavy chain variable domain comprising the amino acid sequence of SEQ ID NO:1, and (ii) a light chain variable domain comprising the amino acid sequence of SEQ ID NO:2 at a concentration of 80 mg/ml to 300 mg/ml, and

adding arginine, arginine hydrochloride, or a combination thereof to said aqueous pharmaceutical formulation, wherein the pH of the pharmaceutical formulation ranges from 4.5 to 5.5.

14. The method according to claim 13, wherein the arginine, arginine hydrochloride, or combination thereof is present in a concentration of 150 to 250 mM.

15. The method according to claim 14, wherein the arginine, arginine hydrochloride, or combination thereof is present in a concentration of 200 mM.

16. The method according to any one of claims 13 to 15, wherein the pharmaceutical formulation further comprises a pharmaceutically acceptable buffer.

17. The method according to claim 16, wherein the pharmaceutically acceptable buffer is histidine buffer or citrate buffer.

18. A method of reducing fragmentation of an isolated anti-A β protofibril antibody or fragment thereof, comprising:

providing an aqueous pharmaceutical formulation comprising an isolated anti-A β protofibril antibody or fragment thereof comprising: (i) a heavy chain variable domain

comprising the amino acid sequence of SEQ ID NO:1, and (ii) a light chain variable domain comprising the amino acid sequence of SEQ ID NO:2 at a concentration of 80 mg/ml to 300 mg/ml, and
adding histidine buffer to said aqueous pharmaceutical composition, wherein the pH of the pharmaceutical formulation ranges from 4.5 to 5.5.

19. The method according to claim 18, comprising 15 to 35 mM histidine buffer.
20. The method according to any one of claims 13-19, wherein the pharmaceutical formulation further comprises 0.01% w/v to 0.1% w/v polysorbate 80.